SEASONAL OCCURRENCE OF ERIOPHYID MITES ON ELM TREE IN SAPPORO (JAPAN)*

by

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It is well known that populations of mites are easy to vary as an adaptation to period and respondence to environmental changes. The purpose of this paper is to present a simple population data as a preliminary report on elm mites. Survey was conducted every day from Sept. 1 to Oct. 31 in 1964.

MATERIALS AND METHODS

Elm leaves injured by Eriophyid mites were sampled at random from plots A–a (represents an elm tree in front of Faculty of Agriculture, Hokkaido Univ.), A–b (represents an elm tree at the back of Faculty of Agriculture, Hokkaido Univ.) and S (represents an elm tree near Faculty of Science, Hokkaido Univ.) for an investigation of seasonal occurrence. At S plot, 15 elm leaves were collected at 10 a. m. every day. At the same time a thermo-hygrometer was hung on the trunk (kept one meter height from the ground) to determine temperature and the humidity. Both of A–a and A–b plots were arranged for an observation of populational fluctuation at 5 parts (viz., east, west, south, north and central). According to the height where leaves grown out, A–a plot was also divided in 3 portions (viz., high, middle and low) for investigating the population respectively. 6 leaves from each part were sampled every time. The circumstances of A–a plot and A–b plot were very different. The former stood in a wide place was without any interruption from sunlight and wind; whereas the latter, surrounded and prevented by large trees, was kept in the shade. The leaves collected, were brought into laboratory and put in a glass bottle with alcohol-sugar solution. A week later, the leaves were cast away and remained solutions were centrifuged. From which, 2 cc. (from the bottom of conical tube) were reserved and determined by examining under stereoscopic microscope. Species and numbers of Eriophyid mites were recorded. Mites numbers were calculated in per cm^2 and compared among 5 species.

RESULTS AND DISCUSSION

Eriophyid mites on elm tree from plots A–a, A–b and S, totalized in (1) every 10 days, (2) 3 different height of elm tree and (3) 5 parts (from direction), are presented graphically in Figures 6-10, which gave out the following results.

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* Conducted in Sapporo, Japan, in 1964.

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1. *Eriophyes campestricola* (v. Frauenf.) Liro; The maxima were, 1.6 mites/cm^2 in middle September, 0.5 mite/m^2 in low position and 0.5 mite/cm^2 in central part. The minima were, 0.1 mite/cm^2 in late October, 0.4 mite/cm^2 in both of high and middle positions, and 0.24 mite/cm^2 in north part.

2. *Eriophyes brevipunctatus* Nal.; The maxima were, 1.3 mites/cm^2 in middle September, 0.3 mite/cm^2 in both of low and high positions, and 0.25 mite/cm^2 in east part. The minima were, 0.1 mite/cm^2 in late October, 0.2 mite/cm^2 in middle position and 0.1 mite/cm^2 in central part.

3. *Anthocoptes punctidorsa* K.; The maxima were, 1.3 mites/cm^2 in middle September, 1.1 mites/cm^2 in low position and 0.83 mite/cm^2 in east part. The minima were, 0.2 mite/cm^2 in late October, 0.8 mite/cm^2 in both of high and middle positions, and 0.5 mite/cm^2 in central part.

4. *Oxypleurites ulmi* F.; The maxima were, 0.9 mite/cm^2 in late September, 0.5 mite/cm^2 in low position and 0.4 mite/cm^2 in central part. The minima were, 0.1 mite/cm^2 in late October, 0.4 mite/cm^2 in both of high and middle positions, and 0.25 mite/cm^2 in south part.

5. *Rhyncaphytoptus ulmivagrans* K.; The maxima were, 1.6 mites/cm^2 in middle September, 1.3 mites/cm^2 in low position and 2.03 mites/cm^2 in north part. The minima were, 0.1 mite/cm^2 in late October, 0.6 mite/cm^2 in middle position and 0.82 mite/cm^2 in central part.

The weather in 1964 was colder than ordinary years and severely influenced an appearance of mites. Eriophyid mites on undersurfaces of elm leaves came into view under stereoscopic microscope on the time near the end of August. But defoliation of elm tree came to the end in late October. So that sampling work was continued only two months (from Sept. 1 to Oct. 31).

On the whole, rise or decline of the graphs followed a remarkably similar pattern among 5 species of Eriophyid mites on elm. The charts show that each species similarly has the maximum population in middle September (Fig. 6) and in low position of the tree (Fig. 7). In comparison among 5 parts (viz., east, west, south, north and central), the maximum population was given from north part in September and from west part in Octobar (Figs. 8 and 9).

It was considered that high temperature and the lowest humidity in middle September enabled the mites to reach the high peak of their population (Fig. 6). Nevertheless no reasonable explanation was accepted for the mites numerous at north part in September and west part in October. This was remained as a pending problem and put in expection of later study.

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Fig. 1. A view of A-a plot.

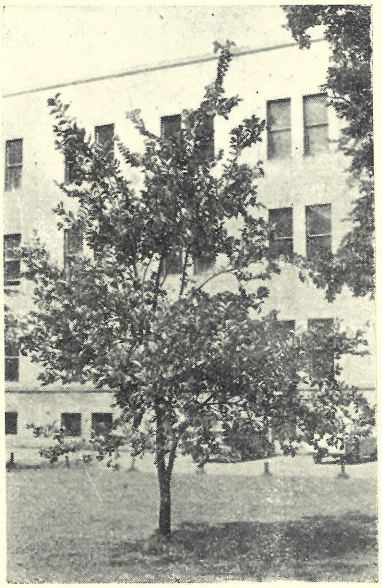

Fig. 2. do., more close.

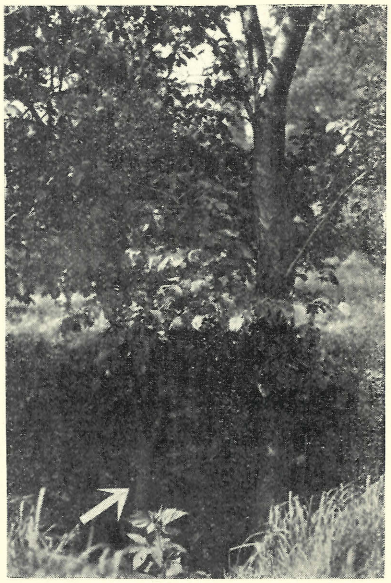

Fig. 3. A close view of A-b plot.

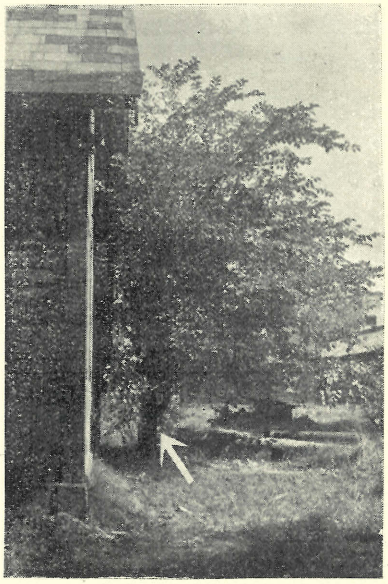

Fig. 4. A view of S plot.

Fig. 5. Elm leaves, which undersurfaces were inhabited by a lot of Eriophyid mites.

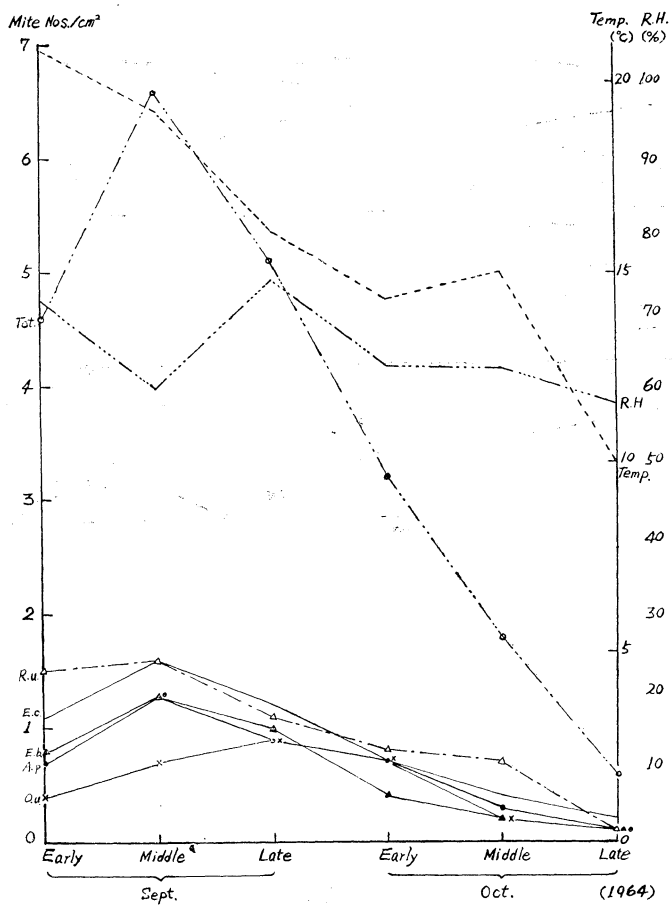

Fig. 6. Showing a variation of numbers of Eriophyid mites on elm, from plots A-a, A-b and S, totalized in every 10 days.

Explanatory Notes for Figs. 6-10.

(1) ——————— for *Eriophyes campestricola* (v. Frauenf.) Liro.
(2) ▲———▲ for *Eriophyes brevipunctatus* Nal.
(3) ●———● for *Anthocoptes punctidorsa* Keifer.
(4) ×———× for *Oxypleurites ulmi* Farkas.
(5) △-·-·-·-△ for *Rhyncaphytoptus ulmivagrans* Keifer.
(6) ○-···-···-○ for total numbers of the mites.
(7) — ···· — ···· — for % of relative humidity.
(8) ····· for °C of temperature.
(9) — ··· — ··· — for total nos. of the mites in average in Sept.-Oct., '64.
(10) —·····— ····· — for total nos. of the mites in Sept., '64.
(11) —·····—····· for total nos. of the mites in Oct., '64.

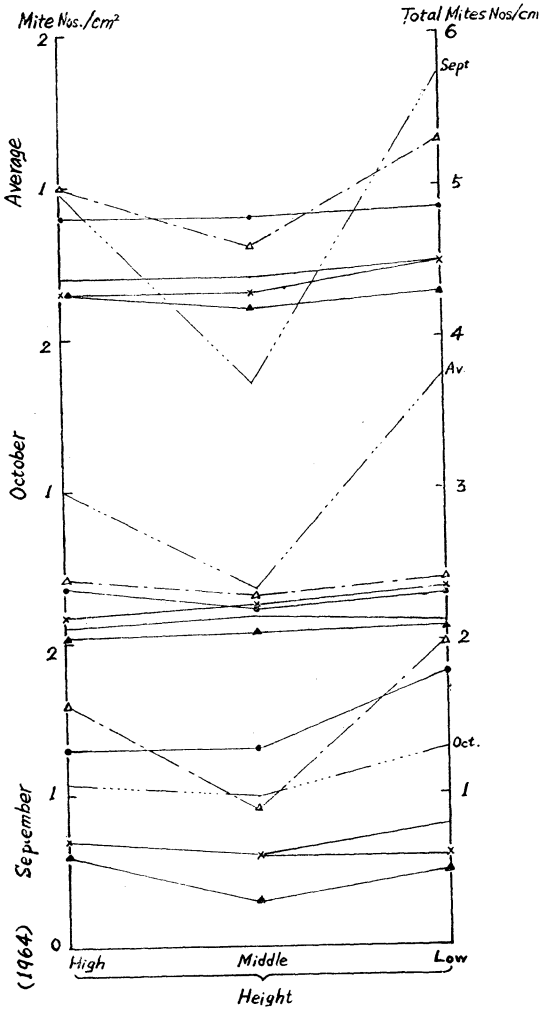

Fig. 7. Showing a variation of numbers of Eriophyid mites, from A-a plot, totalized in 3 different height of the tree.

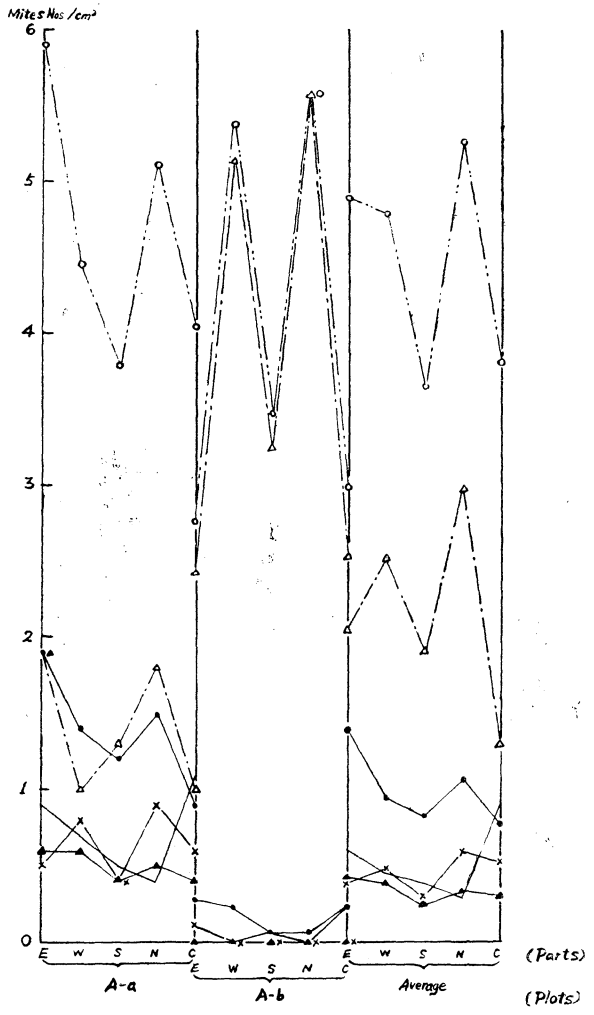

Fig. 8. Showing a variation of numbers of Eriophyid mites, from plots A-a and A-b, collected in Sept. 1964, totalized in 5 parts.

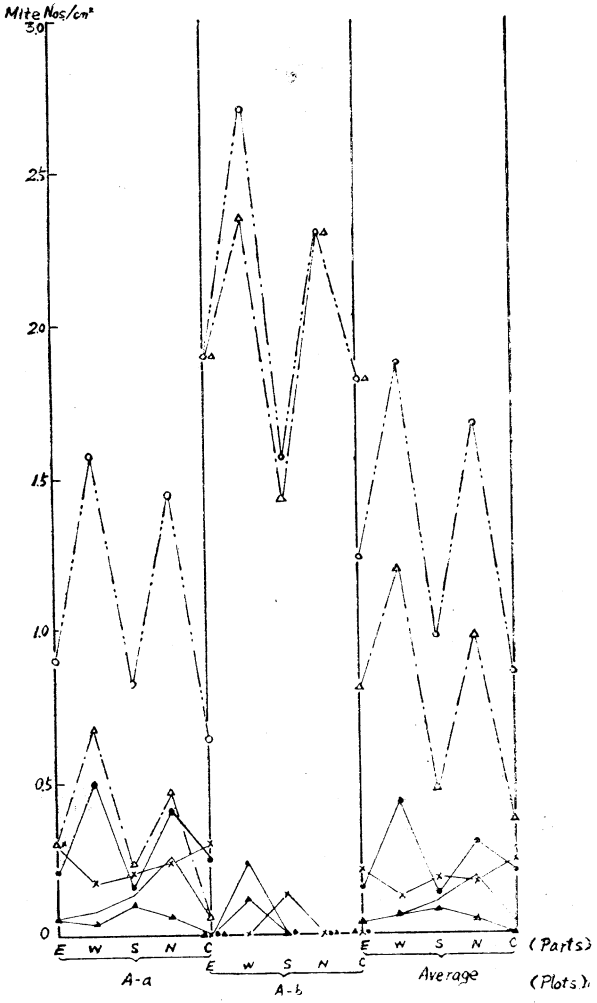

Fig. 9. do., collected in Oct. 1964.

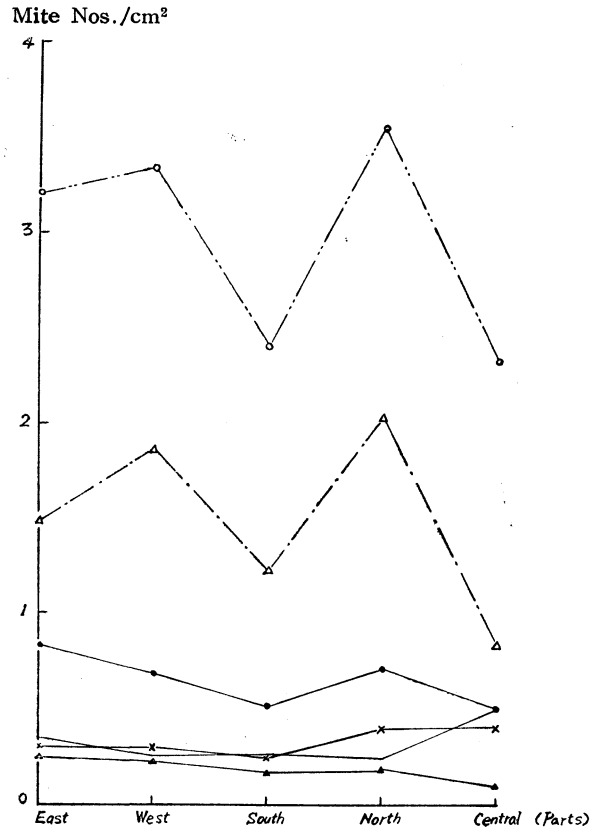

Fig. 10. Analytical data from figs. 8 and 9. The mites are retotalized in combination with Sept. and Oct.

LITERATURE CITED

(1) Boczek, J. 1961. Studies on Eriophyid Mites of Poland. Prace nauk. Inst. Ochrony Roślin, 3(2):5-86.
(2) Farkas, H. K. 1960. Über Die Eriophyiden (Acarina) Ungarns I. Acta Zool. Acad. Sci. Hungar., 6(3/4):315-339.
(3) Keifer, H. H. 1939a. Eriophyid Studies VI. Bul. Cal. Dept. Agr., 28(6):416-426.
(4) Keifer, H. H. 1939b. Eriophyid Studies VII. Bul. Cal. Dept. Agr., 28:484-505.
(5) Keifer, H. H. 1943. Eriophyid Studies XIII. Bul. Cal. Dept. Agr., 32(3):212-222.
(6) Keifer, H. H. 1952. The Eriophyid Mites of California. Bul. Cal. Insect Surv., 2(1):1-123.
(7) Liro, J. I. 1941. Über neue und seltene Eriophyiden (Acarina). Ann. Zool. Soc. Zool. Bot. Fenn. Vanamo, 8(7):1-53.
(8) Liro, J. I. & H. Roivainen. 1951. Eriophyidae. Suomen Eläimat, Animalia Fennica, 6:1-281.
(9) Nalepa, A. 1898. Eriophyidae. Das Tierreich, 4:1-74.
(10) Nalepa, A. 1911. Eriophyiden, Gallenmilben. Zoologica, 24(61):167-293.
(11) Schlechtendal, D. H. R. von. 1816. Eriophyidocecidien. Zoologica, 24(61):295-498.

札幌(日本北海道)楡樹 Eriophyid Mites 之發生情形

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摘　要

本文係就日本北海道大學（位於日本北海道札幌市）理學部及農學部附近之楡樹 Eriophyid Mites，調查其發生情形所得之結果。

文中所列述之楡樹 Eriophyid Mites 包括有下面之5種。

1. *Eriophyes campestricola* (v. Frauenf.) Liro
2. *Eriophyes brevipunctatus* Nalepa
3. *Anthocoptes punctidorsa* Keifer
4. *Oxypleurites ulmi* Farkas
5. *Rhyncaphytoptus ulmivagrans* Keifer

根據所得結果，最高蟲數發生於溫度極高而濕度最低之9月中旬。